REMARKS

Claims 1, 2, 4-10 and 16 stand rejected over prior art, and claim 15 is withdrawn from consideration as being directed to a non-elected invention.

Claims 1, 2, 4, 6-10 and 16-20 stand rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,296,189 to Kang et al. Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kang et al.

Kang et al. was cited as disclosing a conductive composition comprising copper particles and alumina particles, which composition is formed into a conductive paste and screen-printed onto a ceramic substrate to form a printed circuit board. The conductive composition is said to comprise copper particles and alumina particles having a size of from about 0.05 to about 0.1 μm (from about 50 to 100 nm). Kang et al. was further cited as disclosing that other inorganic materials such as TiO_2 or SiO_2 are feasible (as retardants) and have the same function as the alumina particles, citing column 4, lines 30-39.

Although acknowledging that Kang et al. does not specifically teach a conductive composition having SiO_2 and ceramic particles, the Examiner was of the view that because Kang et al. is said to show that TiO_2 and SiO_2 have the same function as alumina, choosing two or more of these sintering retardant materials "is conventional in the art."

Applicants respond as follows.

Independent claims 1 and 2 are directed to a wiring board obtained by coating a copper paste on a ceramic green sheet and firing it to form a conductive layer and insulating layer. In addition to copper powder and an organic vehicle, the copper paste of claim 1 contains, as an essential component, an SiO_2 particle *having an average particle size of 40 nm or less* in addition

to a ceramic particle selected from Al_2O_3, TiO_2, CeO_2 and mullite. The copper paste of claim 2 similarly contains, as an essential component, an SiO_2 particle in an amount of 0.1 to 5 parts by mass per 100 parts by mass of copper powder *having an average particle size of 40 nm or less.*

In the Remarks portion of the Amendment under 37 C.F.R. § 1.116 filed June 3, 2008, Applicants presented test data from the specification comparing a wiring board of Example 1-D of the invention prepared using a copper paste containing an SiO_2 particle having an average particle size of 12 nm with Comparative Example 2-A prepared from a copper paste containing an Al_2O_3 particle having an average particle size of 12 nm *in place of the SiO_2 particle.* As shown in the Table at page 7 of the Amendment, the wiring board of the invention was found to have both a very small waving amount and low resistivity as compared to the Comparative Example. Based thereon, Applicants respectfully disagree that SiO_2 has the same function as alumina, such that Kang et al would not lead one of ordinary skill to substitute SiO_2 particles having an average particle size of 40 nm or less (as claimed) for the alumina particles of Kang et al having a size of from about 0.05 to 0.1 μm (from about 50 to 100 nm, see Kang et al at col. 4, lines 37-39) *with a reasonable expectation of success.* Namely, as demonstrated by the comparative test data, SiO_2 and alumina do not have the same function and are not so easily substituted in a copper paste for a wiring board.

In the Advisory Action dated June 30, 2008, the Examiner maintained the rejection of Kang et al for reasons of record.

So as to further demonstrate criticality in an SiO_2 particle having average particle size of 40 nm or less as a component of the copper paste used to prepare a wiring board, Applicants submit herewith the Declaration under 37 C.F.R. § 1.132 of Kazuyuki Fujii including additional test data for Example 1-J of the specification and test data for an Additional Example. As shown

in the Table at page 2 of the Declaration, reproduced below, only the wiring boards of Examples 1-D and 1J of the invention prepared using a copper paste containing an SiO_2 particle having an average particle size of 12 nm and 30 nm, respectively, within the scope of the claimed SiO_2 particle having an average particle size of 40 nm or less provided wiring boards having *both* a small waving amount and low resistivity. On the other hand, Comparative Example 2-A prepared using a copper paste containing, as an additive, an Al_2O_3 particle having an average particle size of 30 nm *in place of* the SiO_2 particle resulted in a wiring board having a substantially greater waving amount and a much higher resistivity. The Additional Example, prepared using a copper paste containing an SiO_2 particle having an average particle size of 80 nm outside the scope of an SiO_2 particle having an average particle size of 40 nm or less, provided a wiring board having a waving amount comparable to that of the samples of invention, but suffered from much higher resistivity.

Table

		Particle Size of Cu	Additive (1)			Additive (2)			Waving Amount	Resistivity
			Additive	Particle Size of Additive (nm)	Amount of Additive Added (parts by mass)	Additive	Particle Size of Additive (nm)	Amount of Additive Added (parts by mass)		
Example	1-D	4.7	SiO_2	12	1.0	none	-	-	-0.01	2.5
	2-A	4.7	Al_2O_3	13	1.0	none	-	-	1.02	4.4
	1-J	4.7	SiO_2	30	1.0	none	-	-	0.02	2.5
	Additional Example	4.7	SiO_2	80	1.0	none	-	-	-0.05	4.8
									(mm)	(μΩ·cm)

The above-noted results demonstrate that (1) SiO_2 and alumina do not have the same function and are not easily substituted in the copper paste for a wiring board, and (2) an upper limit of the average particle size of the SiO_2 particle of 40 nm is critical for achieving the effects

of the invention. That is, even if it would have been obvious to substitute an SiO_2 particle for the Al_2O_3 particle of Kang et al (which applicants dispute), the resulting products would still be materially different. This is because Kang et al teaches use of alumina particles having a size of from about 0.05 to 0.1 μm (from about 50 to 100 nm), and did not recognize criticality in an average particle size of 40 nm or less, as claimed, so as to provide a wiring board having both a very small waving amount and a low resistivity. In summary, the above-noted test data establishes that the wiring board of the invention is different, in an unobvious way, from the prior art products.

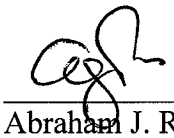
In view of the Declaration evidence submitted herewith and the above remarks, it is respectfully submitted that the present claims are neither anticipated nor obvious over Kang et al, and withdrawal of the foregoing rejection is respectfully requested.

Withdrawal of all rejections, rejoinder of withdrawn method claim 15 which includes all of the limitations of product claim 1, and allowance of claims 1, 2, 4-10 and 15-20 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Abraham J. Rosner
Registration No. 33,276

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON DC SUGHRUE/265550

65565
CUSTOMER NUMBER

Date: September 2, 2008